Amendments to the Claims

Please cancel Claims 1-18 without prejudice to or disclaimer of the subject matter contained therein. Please add new Claims 19-30.

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claims 1-18 (canceled)

19. (new) A method for embedding a digital-watermark in a document image, comprising:

inputting the document image and digital-watermark information;

counting a number of letters in the document image;

calculating an embedding capacity based on the number of the letters;

determining whether or not the entire digital-watermark information is capable of being embedded in the document image based on the calculated embedding capacity; and

embedding the digital-watermark information in the document image based on a result of the determination of whether or not the entire digital-watermark information is capable of being embedded in the document image.

20. (new) A method according to Claim 19, further comprising:

inputting an embedding strength of the digital-watermark; and

setting a first parameter determining robustness to attack on the digital-watermark information to be embedded in the image and a second parameter determining quality of the image in which the digital-watermark information is to be embedded in accordance with the embedding strength,

wherein the embedding capacity is calculated based on the number of letters and the embedding strength, and

wherein, when it is determined that the entire digital-watermark information is not capable of being embedded, at least one of the parameters is updated so as to embed a larger amount of the digital-watermark information in the image in accordance with a robustness-priority forced embedding mode or an image-quality-priority forced embedding mode, and the digital-watermark is embedded using the updated parameter.

21. (new) A method according to Claim 20, wherein the digital-watermark information is embedded in the document image by rotating the letters so as to change the inclination angle of the letters.

22. (new) A method according to Claim 21, wherein the second parameter specifies the range of rotation angle of the letters.

23. (new) A method according to Claim 21, wherein the first parameter specifies the repetition number of embedding the digital-watermark information in the image.

24. (new) A method according to Claim 20, wherein the digital-watermark information is embedded in the document image by changing the positions of the letters so as to adjust spaces between the letters.

25. (new) A method according to Claim 24, wherein the second parameter specifies the range of movement of the letters.

26. (new) A method according to Claim 24, wherein the first parameter specifies the repetition number of embedding the digital-watermark information in the image.

27. (new) An apparatus comprising:

an input unit configured to receive a document image and digital-watermark information;

a first determination unit configured to determine an embedding capacity based on a number of the letters in the document image;

a second determination unit configured to determine whether or not the entire digital-watermark information is capable of being embedded in the document image based on the determined embedding capacity; and

an embedding unit configured to embed the digital-watermark information in the document image based on a result of the determination of whether or not the entire digital-watermark information is capable of being embedded in the document image.

28. (new) An apparatus according to Claim 27, further comprising:

an embedding strength input unit configured receive information associated with an embedding strength of the digital-watermark; and

a setting unit configured to set a first parameter determining robustness to attack on the digital-watermark information to be embedded in the image and a second parameter

determining quality of the image in which the digital-watermark information is to be embedded based on the information associated with the embedding strength of the digital-watermark,

wherein the embedding capacity is determined based on the number of letters and the information associated with the embedding strength of the digital-watermark,

wherein, when it is determined that the entire digital-watermark information is not capable of being embedded, at least one of the parameters is updated so as to embed a larger amount of the digital-watermark information in the image in accordance with a robustness-priority forced embedding mode or an image-quality-priority forced embedding mode, and the digital-watermark is embedded using the updated parameter.

29. (new) A computer-readable medium storing instructions which, when executed by an apparatus, causes the apparatus to perform operations comprising:

receiving a document image and digital-watermark information;

determining an embedding capacity based on a number of the letters in the document image;

determining whether or not the entire digital-watermark information is capable of being embedded in the document image based on the determined embedding capacity; and

embedding the digital-watermark information in the document image based on a result of the determination of whether or not the entire digital-watermark information is capable of being embedded in the document image.

30. (new) A computer-readable medium according to Claim 29, wherein the operations further comprise:

receiving information associated with an embedding strength of the digital-watermark; and

setting a first parameter determining robustness to attack on the digital-watermark information to be embedded in the image and a second parameter determining quality of the image in which the digital-watermark information is to be embedded based on the information associated with the embedding strength of the digital-watermark,

wherein the embedding capacity is determined based on the number of letters and the information associated with the embedding strength of the digital watermark, and

wherein, when it is determined that the entire digital-watermark information is not capable of being embedded, at least one of the parameters is updated so as to embed a larger amount of the digital-watermark information in the image in accordance with a robustness-priority forced embedding mode or an image-quality-priority forced embedding mode, and the digital-watermark is embedded using the updated parameter.